

Appl. No. 10/577,990
Amdt. dated August 29, 2008
Reply to Office action of May 30, 2008

REMARKS

Claims 8-25 are pending in the application. New claim 26 is presented herein.

Reconsideration of the rejection of claims 8-15, and 20-25 under 35 U.S.C. 103(a) as being unpatentable over US 7,017,335 to Huber et al in view of US 7,263,972 to Tokuda et al is respectfully requested.

Claim 8 is directed to an apparatus for introducing a reducing agent containing urea into the exhaust of an internal combustion engine, the apparatus comprising

a reservoir,

a delivery unit,

a flow path for the reducing agent, the flow path leading from the reservoir to the delivery unit,

a ventilation device for ventilating at least one region of the flow path, the ventilation device being disposed in the flow path and being situated at a geodetic high point of the flow path,

a ventilation opening in the ventilation device that always permits a return of a minimal fluid quantity to the reservoir, and

a ventilation return line connecting the ventilation opening and the reservoir.

Huber et al discloses a reservoir (1), a delivery unit (4), a flow path (1a) for the reducing agent, a filter (3), and a ventilation device in the form of a metering valve (7). However, Huber et al fails to disclose the ventilation device being situated at a geodetic high point of the flow path.

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Tokuda et al is relied upon for teaching an apparatus for supplying fuel of an internal combustion engine with a ventilation device (210) being situated at a geodetic high point of the flow path (220). The examiner asserts that it would have been recognized by one of ordinary skill in the art at the time the invention was made, that applying the known technique of using a ventilation device being situated at a geodetic high point of the flow path, as taught by Tokuda to the exhaust purifying system of Huber, would have yielded predictable results and resulted in an improved system for increasing the pressure of reducing agent supplying to the exhaust gas system of an internal combustion engine more accurate, to further improve the performance of the engine and the efficiency of the NOx catalyst system.

However, even if the examiner's combination of the references is proper, contrary to the examiner's position, the metering valve (7) of Huber et al cannot permit a return to the reservoir, as recited in claim 8, as there is no return line leading from the valve (7) to the reservoir (1).

Applicant disagrees with the examiner's position that Huber discloses the ventilation device having: a float valve, at least not expressly although implied; a solenoid valve; or a flow throttle.

More particularly, Huber does not explicitly disclose that metering valve (7) is a venting device. Column 3, lines 58 and 59, only disclose that "venting procedures may be executed via metering valve (7)". It is not clear whether metering valve (7) itself may constitute a venting valve or whether a separate venting valve is controlled via metering valve (7).

Further, it is rather evident that metering valve (7) cannot be situated at a geodetic high point of the flow path, since it must be situated close to the mixing chamber and the exhaust

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path, which in most cases are situated at a geodetic low point of the flow path. Therefore, the skilled person is not motivated to place metering valve (7) at another geodetic position.

Furthermore, with regard to the Tokuda reference, Applicant disagrees with the interpretation that valve (210) represents a ventilation device. Tokuda discloses a fuel system having a low-pressure part (low-pressure rail 160) and a high-pressure part (high-pressure rail 130). As explained in column 12, lines 11 to 20, high-pressure rail 130 is connected on its downstream side with an “electromagnetic relief valve 210”. Electromagnetic relief valve 210 is opened in response to a control signal from ECU 300, and guides the fuel within high-pressure delivery pipe 130 to fuel return pipe 220. As is explained in column 12, lines 36 to 38, of Tokuda, electromagnetic relief valve 210 corresponds to a “pressure release means.” However, a pressure release means that guides fuel back to fuel return pipe 220 and further back to fuel reservoir 200 is not a ventilation device which is provided in order to remove air from at least one region of the flow path. By consequence, Tokuda does not disclose a ventilation device.

Further, it is clear that figure 2 of Tokuda does not represent the geodetic relationships of the components of the fuel system, e.g. it is very unlikely that ECU 300 is situated geodetically even lower than fuel reservoir 200. Further, it is very unlikely that intake manifold injectors 120 are situated geodetically lower than in-cylinder injectors 110. Rather, in most combustion engines, the intake manifold is situated geodetically higher than the cylinders. By consequence, there is no disclosure found that electromagnetic relief valve 210 is situated at a geodetic high point of the flow path.

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It appears that the examiner has ignored the last feature of claim 8 wherein a ventilation opening in the ventilation device is provided that always permits a return of a minimal fluid quantity to the reservoir, since no remark was found in the Office Action with regard to this feature. Neither metering valve 7 of Huber nor electromagnetic relief valve 210 of Tokuda provide such a venting opening. Especially in the fuel system of Tokuda such an opening would considerably reduce the efficiency of the fuel system, since high-pressure fuel would continuously be led from high-pressure rail 130 back to reservoir 200 — without any sense.

Therefore, Applicant believes that the present invention is clearly patentable over Huber et al in view Tokuda et al, and that the current claims are distinguished over the prior art. Therefore, withdrawal of the rejection is respectfully requested.

Reconsideration of the rejection of claims 16-19 under 35 U.S. C 103(a) as being unpatentable over Huber in view of Tokuda, and further in view of design choice is respectfully requested.

The examiner finds that Huber in view of Tokuda discloses all the claimed limitation as except the filter being able to operate in two different installation positions that differ from each other by approximately 90° and the ventilation device being situated at an angle of approximately 45° between the two installation positions.

The examiner continues that it would have been an obvious matter of design choice well within the level of ordinary skill in the art, to arrive at the claimed arrangement.

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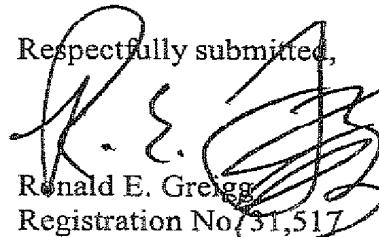
The present application differs from the prior art because the metering device of Huber lacks a return to the reservoir, as discussed above. Neither Huber et al nor Tokuda et al taken alone or when combined disclose or suggest the recited elements of claim 8 as discussed above.

Therefore, Applicant believes that the present invention cannot be unpatentable over Huber et al in view Tokuda et al, and that the current claims are distinguished over the prior art. Therefore, withdrawal of the rejection and allowance of the claims is respectfully requested.

New claim 26 which is presented herein is an independent claim combining the subject matter of current claims 8 and 9. Allowance of new claim 26 is respectfully requested.

The above amendments are being made to place the application in better condition for examination.

Entry of the amendment is respectfully solicited.

Respectfully submitted,

Ronald E. Greigg
Registration No. 31,517
Attorney of Record
CUSTOMER NO. 02119

GREIGG & GREIGG, P.L.L.C.
1423 Powhatan Street
Suite One
Alexandria, VA 22314

Telephone: (703) 838-5500
Facsimile: (703) 838-5554

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